SEQUENCE LISTING

<110> MARKOWITZ, Sanford D.

<120> METHODS FOR TREATING PATIENTS AND IDENTIFYING THERAPEUTICS

<130> CWRU-P01-044

<140> 10/650,112

<141> 2003-08-26

<150> 10/274,177
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<150> 10/229,245
<151> 2002-08-26

<150> 60/406,296
<151> 2002-08-27

<160> 27

<170> PatentIn version 3.2

<210> 1

<211> 1331
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<213> Homo sapiens

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Thr Val Ala Ala Gly Cys Pro Asp Gln Ser Pro Glu Leu Gln Pro Trp
1               5                  10                  15

Asn Pro Gly His Asp Gln Asp His His Val His Ile Gly Gln Gly Lys
            20                  25                  30

Thr Leu Leu Leu Thr Ser Ser Ala Thr Val Tyr Ser Ile His Ile Ser
        35                  40                  45

Glu Gly Gly Lys Leu Val Ile Lys Asp His Asp Glu Pro Ile Val Leu
    50                  55                  60

Arg Thr Arg His Ile Leu Ile Asp Asn Gly Gly Glu Leu His Ala Gly
65                  70                  75                  80

Ser Ala Leu Cys Pro Phe Gln Gly Asn Phe Thr Ile Ile Leu Tyr Gly
                85                  90                  95

Arg Ala Asp Glu Gly Ile Gln Pro Asp Pro Tyr Tyr Gly Leu Lys Tyr
            100                 105                 110

Ile Gly Val Gly Lys Gly Gly Ala Leu Glu Leu His Gly Gln Lys Lys
        115                 120                 125

Leu Ser Trp Thr Phe Leu Asn Lys Thr Leu His Pro Gly Gly Met Ala
    130                 135                 140
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Glu Gly Gly Tyr Phe Phe Glu Arg Ser Trp Gly His Arg Gly Val Ile
145                 150                 155                 160

Val His Val Ile Asp Pro Lys Ser Gly Thr Val Ile His Ser Asp Arg
                165                 170                 175

Phe Asp Thr Tyr Arg Ser Lys Lys Glu Ser Glu Arg Leu Val Gln Tyr
            180                 185                 190

Leu Asn Ala Val Pro Asp Gly Arg Ile Leu Ser Val Ala Val Asn Asp
        195                 200                 205

Glu Gly Ser Arg Asn Leu Asp Asp Met Ala Arg Lys Ala Met Thr Lys
    210                 215                 220

Leu Gly Ser Lys His Phe Leu His Leu Gly Phe Arg His Pro Trp Ser
225                 230                 235                 240

Phe Leu Thr Val Lys Gly Asn Pro Ser Ser Ser Val Glu Asp His Ile
                245                 250                 255

Glu Tyr His Gly His Arg Gly Ser Ala Ala Ala Arg Val Phe Lys Leu
            260                 265                 270

Phe Gln Thr Glu His Gly Glu Tyr Phe Asn Val Ser Leu Ser Ser Glu
        275                 280                 285

Trp Val Gln Asp Val Glu Trp Thr Glu Trp Phe Asp His Asp Lys Val
    290                 295                 300

Ser Gln Thr Lys Gly Gly Glu Lys Ile Ser Asp Leu Trp Lys Ala His
305                 310                 315                 320

Pro Gly Lys Ile Cys Asn Arg Pro Ile Asp Ile Gln Ala Thr Thr Met
                325                 330                 335

Asp Gly Val Asn Leu Ser Thr Glu Val Val Tyr Lys Lys Gly Gln Asp
            340                 345                 350

Tyr Arg Phe Ala Cys Tyr Asp Arg Gly Arg Ala Cys Arg Ser Tyr Arg
        355                 360                 365

Val Arg Phe Leu Cys Gly Lys Pro Val Arg Pro Lys Leu Thr Val Thr
    370                 375                 380

Ile Asp Thr Asn Val Asn Ser Thr Ile Leu Asn Leu Glu Asp Asn Val
385                 390                 395                 400

Gln Ser Trp Lys Pro Gly Asp Thr Leu Val Ile Ala Ser Thr Asp Tyr
                405                 410                 415

Ser Met Tyr Gln Ala Glu Glu Phe Gln Val Leu Pro Cys Arg Ser Cys
            420                 425                 430

Ala Pro Asn Gln Val Lys Val Ala Gly Lys Pro Met Tyr Leu His Ile
        435                 440                 445

Gly Glu Glu Ile Asp Gly Val Asp Met Arg Ala Glu Val Gly Leu Leu
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```
    450                 455                 460

Ser Arg Asn Ile Ile Val Met Gly Glu Met Glu Asp Lys Cys Tyr Pro
465                 470                 475                 480

Tyr Arg Asn His Ile Cys Asn Phe Phe Asp Phe Asp Thr Phe Gly Gly
                485                 490                 495

His Ile Lys Phe Ala Leu Gly Phe Lys Ala Ala His Leu Glu Gly Thr
            500                 505                 510

Glu Leu Lys His Met Gly Gln Gln Leu Val Gly Gln Tyr Pro Ile His
        515                 520                 525

Phe His Leu Ala Gly Asp Val Asp Glu Arg Gly Gly Tyr Asp Pro Pro
    530                 535                 540


Thr Tyr Ile Arg Asp Leu Ser Ile His His Thr Phe Ser Arg Cys Val
545                 550                 555                 560

Thr Val His Gly Ser Asn Gly Leu Leu Ile Lys Asp Val Val Gly Tyr
                565                 570                 575

Asn Ser Leu Gly His Cys Phe Phe Thr Glu Asp Gly Pro Glu Glu Arg
            580                 585                 590

Asn Thr Phe Asp His Cys Leu Gly Leu Leu Val Lys Ser Gly Thr Leu
        595                 600                 605

Leu Pro Ser Asp Arg Asp Ser Lys Met Cys Lys Met Ile Thr Glu Asp
    610                 615                 620

Ser Tyr Pro Gly Tyr Ile Pro Lys Pro Arg Gln Asp Cys Asn Ala Val
625                 630                 635                 640

Ser Thr Phe Trp Met Ala Asn Pro Asn Asn Asn Leu Ile Asn Cys Ala
                645                 650                 655

Ala Ala Gly Ser Glu Glu Thr Gly Phe Trp Phe Ile Phe His His Val
            660                 665                 670

Pro Thr Gly Pro Ser Val Gly Met Tyr Ser Pro Gly Tyr Ser Glu His
        675                 680                 685

Ile Pro Leu Gly Lys Phe Tyr Asn Asn Arg Ala His Ser Asn Tyr Arg
    690                 695                 700

Ala Gly Met Ile Ile Asp Asn Gly Val Lys Thr Thr Glu Ala Ser Ala
705                 710                 715                 720

Lys Asp Lys Arg Pro Phe Leu Ser Ile Ile Ser Ala Arg Tyr Ser Pro
                725                 730                 735

His Gln Asp Ala Asp Pro Leu Lys Pro Arg Glu Pro Ala Ile Ile Arg
            740                 745                 750

His Phe Ile Ala Tyr Lys Asn Gln Asp His Gly Ala Trp Leu Arg Gly
        755                 760                 765
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```
Gly Asp Val Trp Leu Asp Ser Cys Arg Phe Ala Asp Asn Gly Ile Gly
    770                 775                 780

Leu Thr Leu Ala Ser Gly Gly Thr Phe Pro Tyr Asp Asp Gly Ser Lys
785                 790                 795                 800

Gln Glu Ile Lys Asn Ser Leu Phe Val Gly Glu Ser Gly Asn Val Gly
                805                 810                 815

Thr Glu Met Met Asp Asn Arg Ile Trp Gly Pro Gly Gly Leu Asp His
            820                 825                 830

Ser Gly Arg Thr Leu Pro Ile Gly Gln Asn Phe Pro Ile Arg Gly Ile
        835                 840                 845

Gln Leu Tyr Asp Gly Pro Ile Asn Ile Gln Asn Cys Thr Phe Arg Lys
    850                 855                 860

Phe Val Ala Leu Glu Gly Arg His Thr Ser Ala Leu Ala Phe Arg Leu
865                 870                 875                 880


Asn Asn Ala Trp Gln Ser Cys Pro His Asn Asn Val Thr Gly Ile Ala
                885                 890                 895

Phe Glu Asp Val Pro Ile Thr Ser Arg Val Phe Phe Gly Glu Pro Gly
            900                 905                 910

Pro Trp Phe Asn Gln Leu Asp Met Asp Gly Asp Lys Thr Ser Val Phe
        915                 920                 925

His Asp Val Asp Gly Ser Val Ser Glu Tyr Pro Gly Ser Tyr Leu Thr
    930                 935                 940

Lys Asn Asp Asn Trp Leu Val Arg His Pro Asp Cys Ile Asn Val Pro
945                 950                 955                 960

Asp Trp Arg Gly Ala Ile Cys Ser Gly Cys Tyr Ala Gln Met Tyr Ile
                965                 970                 975

Gln Ala Tyr Lys Thr Ser Asn Leu Arg Met Lys Ile Ile Lys Asn Asp
            980                 985                 990

Phe Pro Ser His Pro Leu Tyr Leu  Glu Gly Ala Leu Thr  Arg Ser Thr
        995                 1000                1005

His Tyr  Gln Gln Tyr Gln Pro  Val Val Thr Leu Gln  Lys Gly Tyr
    1010                1015                1020

Thr Ile  His Trp Asp Gln Thr  Ala Pro Ala Glu Leu  Ala Ile Trp
    1025                1030                1035

Leu Ile  Asn Phe Asn Lys Gly  Asp Trp Ile Arg Val  Gly Leu Cys
    1040                1045                1050

Tyr Pro  Arg Gly Thr Thr Phe  Ser Ile Leu Ser Asp  Val His Asn
    1055                1060                1065

Arg Leu  Leu Lys Gln Thr Ser  Lys Thr Gly Val Phe  Val Arg Thr
    1070                1075                1080
```

```
Leu Gln  Met Asp Lys Val Glu  Gln Ser Tyr Pro Gly  Arg Ser His
    1085                 1090                 1095

Tyr Tyr  Trp Asp Glu Asp Ser  Gly Leu Leu Phe Leu  Lys Leu Lys
    1100                 1105                 1110

Ala Gln  Asn Glu Arg Glu Lys  Phe Ala Phe Cys Ser  Met Lys Gly
    1115                 1120                 1125

Cys Glu  Arg Ile Lys Ile Lys  Ala Leu Ile Pro Lys  Asn Ala Gly
    1130                 1135                 1140

Val Ser  Asp Cys Thr Ala Thr  Ala Tyr Pro Lys Phe  Thr Glu Arg
    1145                 1150                 1155

Ala Val  Val Asp Val Pro Met  Pro Lys Lys Leu Phe  Gly Ser Gln
    1160                 1165                 1170

Leu Lys  Thr Lys Asp His Phe  Leu Glu Val Lys Met  Glu Ser Ser
    1175                 1180                 1185

Lys Gln  His Phe Phe His Leu  Trp Asn Asp Phe Ala  Tyr Ile Glu
    1190                 1195                 1200

Val Asp  Gly Lys Lys Tyr Pro  Ser Ser Glu Asp Gly  Ile Gln Val
    1205                 1210                 1215

Val Val  Ile Asp Gly Asn Gln  Gly Arg Val Val Ser  His Thr Ser
    1220                 1225                 1230

Phe Arg  Asn Ser Ile Leu Gln  Gly Ile Pro Trp Gln  Leu Phe Asn
    1235                 1240                 1245

Tyr Val  Ala Thr Ile Pro Asp  Asn Ser Ile Val Leu  Met Ala Ser
    1250                 1255                 1260

Lys Gly  Arg Tyr Val Ser Arg  Gly Pro Trp Thr Arg  Val Leu Glu
    1265                 1270                 1275

Lys Leu  Gly Ala Asp Arg Gly  Leu Lys Leu Lys Glu  Gln Met Ala
    1280                 1285                 1290

Phe Val  Gly Phe Lys Gly Ser  Phe Arg Pro Ile Trp  Val Thr Leu
    1295                 1300                 1305

Asp Thr  Glu Asp His Lys Ala  Lys Ile Phe Gln Val  Val Pro Ile
    1310                 1315                 1320

Pro Val  Val Lys Lys Lys Lys  Leu
    1325                 1330
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<210> 2
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<212> PRT

<213> Homo sapiens

<400> 2

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Ala Gly Cys Pro Asp Gln Ser Pro Glu Leu Gln Pro Trp Asn Pro Gly
1               5                  10                  15

His Asp Gln Asp His His Val His Ile Gly Gln Gly Lys Thr Leu Leu
            20                  25                  30

Leu Thr Ser Ser Ala Thr Val Tyr Ser Ile His Ile Ser Glu Gly Gly
        35                  40                  45

Lys Leu Val Ile Lys Asp His Asp Glu Pro Ile Val Leu Arg Thr Arg
    50                  55                  60

His Ile Leu Ile Asp Asn Gly Gly Glu Leu His Ala Gly Ser Ala Leu
65                  70                  75                  80

Cys Pro Phe Gln Gly Asn Phe Thr Ile Ile Leu Tyr Gly Arg Ala Asp
                85                  90                  95

Glu Gly Ile Gln Pro Asp Pro Tyr Tyr Gly Leu Lys Tyr Ile Gly Val
            100                 105                 110

Gly Lys Gly Gly Ala Leu Glu Leu His Gly Gln Lys Lys Leu Ser Trp
        115                 120                 125

Thr Phe Leu Asn Lys Thr Leu His Pro Gly Gly Met Ala Glu Gly Gly
    130                 135                 140

Tyr Phe Phe Glu Arg Ser Trp Gly His Arg Gly Val Ile Val His Val
145                 150                 155                 160

Ile Asp Pro Lys Ser Gly Thr Val Ile His Ser Asp Arg Phe Asp Thr
                165                 170                 175

Tyr Arg Ser Lys Lys Glu Ser Glu Arg Leu Val Gln Tyr Leu Asn Ala
            180                 185                 190

Val Pro Asp Gly Arg Ile Leu Ser Val Ala Val Asn Asp Glu Gly Ser
        195                 200                 205

Arg Asn Leu Asp Asp Met Ala Arg Lys Ala Met Thr Lys Leu Gly Ser
    210                 215                 220

Lys His Phe Leu His Leu Gly Phe Arg His Pro Trp Ser Phe Leu Thr
225                 230                 235                 240

Val Lys Gly Asn Pro Ser Ser Ser Val Glu Asp His Ile Glu Tyr His
                245                 250                 255

Gly His Arg Gly Ser Ala Ala Ala Arg Val Phe Lys Leu Phe Gln Thr
            260                 265                 270

Glu His Gly Glu Tyr Phe Asn Val Ser Leu Ser Ser Glu Trp Val Gln
        275                 280                 285

Asp Val Glu Trp Thr Glu Trp Phe Asp His Asp Lys Val Ser Gln Thr
    290                 295                 300

Lys Gly Gly Glu Lys Ile Ser Asp Leu Trp Lys Ala His Pro Gly Lys
305                 310                 315                 320
```

```
Ile Cys Asn Arg Pro Ile Asp Ile Gln Ala Thr Thr Met Asp Gly Val
                325                 330                 335

Asn Leu Ser Thr Glu Val Val Tyr Lys Lys Gly Gln Asp Tyr Arg Phe
            340                 345                 350

Ala Cys Tyr Asp Arg Gly Arg Ala Cys Arg Ser Tyr Arg Val Arg Phe
        355                 360                 365

Leu Cys Gly Lys Pro Val Arg Pro Lys Leu Thr Val Thr Ile Asp Thr
    370                 375                 380

Asn Val Asn Ser Thr Ile Leu Asn Leu Glu Asp Asn Val Gln Ser Trp
385                 390                 395                 400

Lys Pro Gly Asp Thr Leu Val Ile Ala Ser Thr Asp Tyr Ser Met Tyr
                405                 410                 415

Gln Ala Glu Glu Phe Gln Val Leu Pro Cys Arg Ser Cys Ala Pro Asn
            420                 425                 430

Gln Val Lys Val Ala Gly Lys Pro Met Tyr Leu His Ile Gly Glu Glu
        435                 440                 445

Ile Asp Gly Val Asp Met Arg Ala Glu Val Gly Leu Leu Ser Arg Asn
    450                 455                 460

Ile Ile Val Met Gly Glu Met Glu Asp Lys Cys Tyr Pro Tyr Arg Asn
465                 470                 475                 480

His Ile Cys Asn Phe Phe Asp Phe Asp Thr Phe Gly Gly His Ile Lys
                485                 490                 495

Phe Ala Leu Gly Phe Lys Ala Ala His Leu Glu Gly Thr Glu Leu Lys
            500                 505                 510

His Met Gly Gln Gln Leu Val Gly Gln Tyr Pro Ile His Phe His Leu
        515                 520                 525

Ala Gly Asp Val Asp Glu Arg Gly Gly Tyr Asp Pro Pro Thr Tyr Ile
    530                 535                 540

Arg Asp Leu Ser Ile His His Thr Phe Ser Arg Cys Val Thr Val His
545                 550                 555                 560

Gly Ser Asn Gly Leu Leu Ile Lys Asp Val Val Gly Tyr Asn Ser Leu
                565                 570                 575

Gly His Cys Phe Phe Thr Glu Asp Gly Pro Glu Glu Arg Asn Thr Phe
            580                 585                 590

Asp His Cys Leu Gly Leu Leu Val Lys Ser Gly Thr Leu Leu Pro Ser
        595                 600                 605

Asp Arg Asp Ser Lys Met Cys Lys Met Ile Thr Glu Asp Ser Tyr Pro
    610                 615                 620

Gly Tyr Ile Pro Lys Pro Arg Gln Asp Cys Asn Ala Val Ser Thr Phe
625                 630                 635                 640
```

```
Trp Met Ala Asn Pro Asn Asn Asn Leu Ile Asn Cys Ala Ala Ala Gly
                645                 650                 655

Ser Glu Glu Thr Gly Phe Trp Phe Ile Phe His His Val Pro Thr Gly
            660                 665                 670

Pro Ser Val Gly Met Tyr Ser Pro Gly Tyr Ser Glu His Ile Pro Leu
        675                 680                 685

Gly Lys Phe Tyr Asn Asn Arg Ala His Ser Asn Tyr Arg Ala Gly Met
    690                 695                 700

Ile Ile Asp Asn Gly Val Lys Thr Thr Glu Ala Ser Ala Lys Asp Lys
705                 710                 715                 720

Arg Pro Phe Leu Ser Ile Ile Ser Ala Arg Tyr Ser Pro His Gln Asp
                725                 730                 735

Ala Asp Pro Leu Lys Pro Arg Glu Pro Ala Ile Ile Arg His Phe Ile
            740                 745                 750

Ala Tyr Lys Asn Gln Asp His Gly Ala Trp Leu Arg Gly Gly Asp Val
        755                 760                 765

Trp Leu Asp Ser Cys Arg Phe Ala Asp Asn Gly Ile Gly Leu Thr Leu
    770                 775                 780

Ala Ser Gly Gly Thr Phe Pro Tyr Asp Asp Gly Ser Lys Gln Glu Ile
785                 790                 795                 800

Lys Asn Ser Leu Phe Val Gly Glu Ser Gly Asn Val Gly Thr Glu Met
                805                 810                 815

Met Asp Asn Arg Ile Trp Gly Pro Gly Gly Leu Asp His Ser Gly Arg
            820                 825                 830

Thr Leu Pro Ile Gly Gln Asn Phe Pro Ile Arg Gly Ile Gln Leu Tyr
        835                 840                 845

Asp Gly Pro Ile Asn Ile Gln Asn Cys Thr Phe Arg Lys Phe Val Ala
    850                 855                 860

Leu Glu Gly Arg His Thr Ser Ala Leu Ala Phe Arg Leu Asn Asn Ala
865                 870                 875                 880

Trp Gln Ser Cys Pro His Asn Asn Val Thr Gly Ile Ala Phe Glu Asp
                885                 890                 895

Val Pro Ile Thr Ser Arg Val Phe Phe Gly Glu Pro Gly Pro Trp Phe
            900                 905                 910

Asn Gln Leu Asp Met Asp Gly Asp Lys Thr Ser Val Phe His Asp Val
        915                 920                 925

Asp Gly Ser Val Ser Glu Tyr Pro Gly Ser Tyr Leu Thr Lys Asn Asp
    930                 935                 940

Asn Trp Leu Val Arg His Pro Asp Cys Ile Asn Val Pro Asp Trp Arg
945                 950                 955                 960
```

```
Gly Ala Ile Cys Ser Gly Cys Tyr Ala Gln Met Tyr Ile Gln Ala Tyr
                965                 970                 975

Lys Thr Ser Asn Leu Arg Met Lys Ile Ile Lys Asn Asp Phe Pro Ser
            980                 985                 990

His Pro Leu Tyr Leu Glu Gly Ala  Leu Thr Arg Ser Thr  His Tyr Gln
        995                 1000                1005

Gln Tyr  Gln Pro Val Val Thr  Leu Gln Lys Gly Tyr  Thr Ile His
    1010                1015                1020

Trp Asp  Gln Thr Ala Pro Ala  Glu Leu Ala Ile Trp  Leu Ile Asn
    1025                1030                1035

Phe Asn  Lys Gly Asp Trp Ile  Arg Val Gly Leu Cys  Tyr Pro Arg
    1040                1045                1050

Gly Thr  Thr Phe Ser Ile Leu  Ser Asp Val His Asn  Arg Leu Leu
    1055                1060                1065

Lys Gln  Thr Ser Lys Thr Gly  Val Phe Val Arg Thr  Leu Gln Met
    1070                1075                1080

Asp Lys  Val Glu Gln Ser Tyr  Pro Gly Arg Ser His  Tyr Tyr Trp
    1085                1090                1095

Asp Glu  Asp Ser Gly Leu Leu  Phe Leu Lys Leu Lys  Ala Gln Asn
    1100                1105                1110

Glu Arg  Glu Lys Phe Ala Phe  Cys Ser Met Lys Gly  Cys Glu Arg
    1115                1120                1125

Ile Lys  Ile Lys Ala Leu Ile  Pro Lys Asn Ala Gly  Val Ser Asp
    1130                1135                1140

Cys Thr  Ala Thr Ala Tyr Pro  Lys Phe Thr Glu Arg  Ala Val Val
    1145                1150                1155

Asp Val  Pro Met Pro Lys Lys  Leu Phe Gly Ser Gln  Leu Lys Thr
    1160                1165                1170

Lys Asp  His Phe Leu Glu Val  Lys Met Glu Ser Ser  Lys Gln His
    1175                1180                1185

Phe Phe  His Leu Trp Asn Asp  Phe Ala Tyr Ile Glu  Val Asp Gly
    1190                1195                1200

Lys Lys  Tyr Pro Ser Ser Glu  Asp Gly Ile Gln Val  Val Val Ile
    1205                1210                1215

Asp Gly  Asn Gln Gly Arg Val  Val Ser His Thr Ser  Phe Arg Asn
    1220                1225                1230

Ser Ile  Leu Gln Gly Ile Pro  Trp Gln Leu Phe Asn  Tyr Val Ala
    1235                1240                1245

Thr Ile  Pro Asp Asn Ser Ile  Val Leu Met Ala Ser  Lys Gly Arg
    1250                1255                1260
```

```
Tyr Val  Ser Arg Gly Pro Trp  Thr Arg Val Leu Glu  Lys Leu Gly
    1265                1270                1275

Ala Asp  Arg Gly Leu Lys Leu  Lys Glu Gln Met Ala  Phe Val Gly
    1280                1285                1290

Phe Lys  Gly Ser Phe Arg Pro  Ile Trp Val Thr Leu  Asp Thr Glu
    1295                1300                1305

Asp His  Lys Ala Lys Ile Phe  Gln Val Val Pro Ile  Pro Val Val
    1310                1315                1320

Lys Lys  Lys Lys Leu
    1325
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<210> 3
<211> 732
<212> PRT
<213> Homo sapiens

<400> 3

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Leu Gln Glu Val His Val Ser Lys Glu Thr Ile Gly Lys Ile Ser Ala
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Ala Ser Lys Met Met Trp Cys Ser Ala Ala Val Asp Ile Met Phe Leu
            20                  25                  30

Leu Asp Gly Ser Asn Ser Val Gly Lys Gly Ser Phe Glu Arg Ser Lys
        35                  40                  45

His Phe Ala Ile Thr Val Cys Asp Gly Leu Asp Ile Ser Pro Glu Arg
    50                  55                  60


Val Arg Val Gly Ala Phe Gln Phe Ser Ser Thr Pro His Leu Glu Phe
65                  70                  75                  80

Pro Leu Asp Ser Phe Ser Thr Gln Gln Glu Val Lys Ala Arg Ile Lys
                85                  90                  95

Arg Met Val Phe Lys Gly Gly Arg Thr Glu Thr Glu Leu Ala Leu Lys
            100                 105                 110

Tyr Leu Leu His Arg Gly Leu Pro Gly Gly Arg Asn Ala Ser Val Pro
        115                 120                 125

Gln Ile Leu Ile Ile Val Thr Asp Gly Lys Ser Gln Gly Asp Val Ala
    130                 135                 140

Leu Pro Ser Lys Gln Leu Lys Glu Arg Gly Val Thr Val Phe Ala Val
145                 150                 155                 160

Gly Val Arg Phe Pro Arg Trp Glu Glu Leu His Ala Leu Ala Ser Glu
                165                 170                 175

Pro Arg Gly Gln His Val Leu Leu Ala Glu Gln Val Glu Asp Ala Thr
            180                 185                 190
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```
Asn Gly Leu Phe Ser Thr Leu Ser Ser Ser Ala Ile Cys Ser Ser Ala
        195                 200                 205

Thr Pro Asp Cys Arg Val Glu Ala His Pro Cys Glu His Arg Thr Leu
    210                 215                 220

Glu Met Val Arg Glu Phe Ala Gly Asn Ala Pro Cys Trp Arg Gly Ser
225                 230                 235                 240

Arg Arg Thr Leu Ala Val Leu Ala Ala His Cys Pro Phe Tyr Ser Trp
                245                 250                 255

Lys Arg Val Phe Leu Thr His Pro Ala Thr Cys Tyr Arg Thr Thr Cys
            260                 265                 270

Pro Gly Pro Cys Asp Ser Gln Pro Cys Gln Asn Gly Gly Thr Cys Val
        275                 280                 285

Pro Glu Gly Leu Asp Gly Tyr Gln Cys Leu Cys Pro Leu Ala Phe Gly
    290                 295                 300

Gly Glu Ala Asn Cys Ala Leu Lys Leu Ser Leu Glu Cys Arg Val Asp
305                 310                 315                 320

Leu Leu Phe Leu Leu Asp Ser Ser Ala Gly Thr Thr Leu Asp Gly Phe
                325                 330                 335

Leu Arg Ala Lys Val Phe Val Lys Arg Phe Val Arg Ala Val Leu Ser
            340                 345                 350

Glu Asp Ser Arg Ala Arg Val Gly Val Ala Thr Tyr Ser Arg Glu Leu
        355                 360                 365

Leu Val Ala Val Pro Val Gly Glu Tyr Gln Asp Val Pro Asp Leu Val
    370                 375                 380

Trp Ser Leu Asp Gly Ile Pro Phe Arg Gly Gly Pro Thr Leu Thr Gly
385                 390                 395                 400


Ser Ala Leu Arg Gln Ala Ala Glu Arg Gly Phe Gly Ser Ala Thr Arg
                405                 410                 415

Thr Gly Gln Asp Arg Pro Arg Arg Val Val Val Leu Leu Thr Glu Ser
            420                 425                 430

His Ser Glu Asp Glu Val Ala Gly Pro Ala Arg His Ala Arg Ala Arg
        435                 440                 445

Glu Leu Leu Leu Leu Gly Val Gly Ser Glu Ala Val Arg Ala Glu Leu
    450                 455                 460

Glu Glu Ile Thr Gly Ser Pro Lys His Val Met Val Tyr Ser Asp Pro
465                 470                 475                 480

Gln Asp Leu Phe Asn Gln Ile Pro Glu Leu Gln Gly Lys Leu Cys Ser
                485                 490                 495

Arg Gln Arg Pro Gly Cys Arg Thr Gln Ala Leu Asp Leu Val Phe Met
```

```
            500                 505                 510

Leu Asp Thr Ser Ala Ser Val Gly Pro Glu Asn Phe Ala Gln Met Gln
        515                 520                 525

Ser Phe Val Arg Ser Cys Ala Leu Gln Phe Glu Val Asn Pro Asp Val
    530                 535                 540

Thr Gln Val Gly Leu Val Val Tyr Gly Ser Gln Val Gln Thr Ala Phe
545                 550                 555                 560

Gly Leu Asp Thr Lys Pro Thr Arg Ala Ala Met Leu Arg Ala Ile Ser
                565                 570                 575

Gln Ala Pro Tyr Leu Gly Gly Val Gly Ser Ala Gly Thr Ala Leu Leu
            580                 585                 590

His Ile Tyr Asp Lys Val Met Thr Val Gln Arg Gly Ala Arg Pro Gly
        595                 600                 605

Val Pro Lys Ala Val Val Val Leu Thr Gly Gly Arg Gly Ala Glu Asp
    610                 615                 620

Ala Ala Val Pro Ala Gln Lys Leu Arg Asn Asn Gly Ile Ser Val Leu
625                 630                 635                 640

Val Val Gly Val Gly Pro Val Leu Ser Glu Gly Leu Arg Arg Leu Ala
                645                 650                 655

Gly Pro Arg Asp Ser Leu Ile His Val Ala Ala Tyr Ala Asp Leu Arg
            660                 665                 670

Tyr His Gln Asp Val Leu Ile Glu Trp Leu Cys Gly Glu Ala Lys Gln
        675                 680                 685

Pro Val Asn Leu Cys Lys Pro Ser Pro Cys Met Asn Glu Gly Ser Cys
    690                 695                 700

Val Leu Gln Asn Gly Ser Tyr Arg Cys Lys Cys Arg Asp Gly Trp Glu
705                 710                 715                 720

Gly Pro His Cys Glu Asn Arg Phe Leu Arg Arg Pro
                725                 730
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<210> 4
<211> 4171
<212> DNA
<213> Homo sapiens

<400> 4

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ccctggggcc acatccacag tggctgctgg gtgccctgac cagagccctg agttgcaacc    180

ctggaaccct ggccatgacc aagaccacca tgtgcatatc ggccagggca agacactgct    240
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cgcgacccct cgcggccctg gggcaaggac aactactgga tgctcaaccc caacagcgag 600

tacaccttcg ccgacggggt cttccgccgc cgccgcaagc gcctcagcca ccgcgcgccg 660

gtccccgcgc ccgggctgcg gcccgaggag gccccgggcc tccccgccgc cccgccgccc 720

gcgcccgccg ccccggcctc gccccgcatg cgctcgcccg cccgccagga ggagcgcgcc 780

agccccgcgg gcaagttctc cagctccttc gccatcgaca gcatcctgcg caagcccttc 840

cgcagccgtc gcctcaggga cacggccccc gggacgacgc ttcagtgggg cgccgcgccc 900

tgcccgccgc tgcccgcgtt ccccgcgctc ctccccgcgg cgccctgcag ggccctgctg 960

ccgctctgcg cgtacggcgc gggcgagccg gcgcggctgg gcgcgcgcga ggccgaggtg 1020

ccaccgaccg cgccgccccc cctgcttgca cctctcccgg cggcggcccc cgccaagcca 1080

ctccgaggcc cggcggccgg cggcgcgcac ctgtactgcc ccctgcggct gcccgcagcc 1140

ctgcaggcgg ccttagtccg ncgtcctggc ccgcacctgt cgtacccggt ggagacgctc 1200

ctagcttga 1209

<210> 10
<211> 1474
<212> DNA

<213> Homo sapiens

<400> 10

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gtccggggct gctaacaacg gctacattcc tcccccaggg ccaagggaaa tcctgagcgc 180

aggccagggt tgtttggttt tgaggtgtgc tgggatgaaa ggcaccctgg aagtggaagg 240

ttcggtcatt cattaattaa ttacatctat aattgagggt ttgttcttaa gagcgagtcc 300

tttgaaagta ctttccttca aacagtgact gccacaaagg catcagatat tcaccacctt 360

ctcggctgcc tcagcacagc aagctttatt ctgggacctg agatcctgtt ctgagctggc 420

tttcccttct ccaggctcgc tcaccctccc tttagagata gtggatggta agatgaccaa 480

tgctcagatt attcttctca ttgacaatgc caggatggca gtggatgact tcaacctcaa 540

gaaatggaga agcatcatgt gccaagtgac ttcaatgtca atgtgaaggt ggatacaggt 600

cccagggaag atctgattaa ggtcctggag gatatgagac aagaatatga gcttataata 660

aagaagaagc atcgagactt ggacacttgg tataaagaac agtctgcagc catgtcccag 720

gaggcagcca gtccagccac tgtgcagagc agacaaggtg acatccacga actgaagcgc 780

acattccagg ccctggagat tgacctgcag gcacagtaca gcacgaaatc tgctttggaa 840

aacatgttat ccgagaccca gtctcggtac tcctgcaagc tccaggacat gcaagagatc 900

atctcccact atgaggagga actgacgcag ctacgccacg aactggagcg gcagaacaat 960

gaataccaag tgctgctggg catcaaaacc cacctggaga aggaaatcac cacgtaccga 1020

cggctcctgg agggagagag tgaagggaca cgggaagaat caaagtcgag catgaaagtg 1080

tctgcaactc caaagatcaa ggccataacc caggagacca tcaacggaag attagttctt 1140

tgtcaagtga atgaaatcca aaagcacgca tgagaccaat gaaagtttcc gcctgttgta 1200

aaatctattt tcccccaagg aaagtccttg cacagacacc agtgagtgag ttctaaaaga 1260

taccccttgga attatcagac tcagaaactt ttatttttt tttctgtaac agtctcacca 1320

gacttctcat aatgctctta atatattgca cttttctaat caaagtgcga gtttatgagg 1380

gtaaagctct actttcctac tgcagccttc agattctcat cattttgcat ctattttgta 1440

gccaataaaa ctccgcacta gcaaaaaaaa aaaa 1474

<210> 11
<211> 411
<212> DNA

<213> Homo sapiens

<400> 11

ttttttttt aaaaaaagag gcttggtaag tttttgatgc ttagttgact tttagcatta 60

tccagcattt gtattatgaa ccagtgagta ctgtaatttt tctttccctt tcagaaagac 120

tcaaagggaa catataaatg tttcctattt ttaatgtggc aatagtgtag ctaacactgg 180

tacagacgga ataaacacac ctctaatatt ctcctgaaga tttggtgatc cagtttcaaa 240

taaggtatgg gaaaaacaga tgttttcatt atcgccactt aatccttact tccgattata 300

attatacatg tttggctgta ataactatac taaagcatgc ttgtgaaagt agacttctac 360

aaggacagaa aacccacaac aacaaagatc gatcacgaaa gacaaggcat a 411

<210> 12
<211> 2336
<212> DNA

<213> Homo sapiens

<400> 12

cttttcttcc gcacggttgg aggaggtcgg ctggttatcg ggagttggag ggctgaggtc 60

gggagggtgg tgtgtacaga gctctaggac tcacgcacca ggccagtcgc ggattttggg 120

ccgaggcctg ggttacaagc agcaagtgcg cggttggggc cactgcgagg ccgttttaga 180

aaactgttta aaacaaagag caattgatgg ataaatcagg aatagattct cttgaccatg 240

tgacatctga tgctgtggaa cttgcaaatc gaagtgataa ctcttctgat agcagcttat 300

ttaaaactca gtgtatccct tactcaccta aaggggagaa aagaaacccc attcgaaaat 360

ttgttcgtac acctgaaagt gttcacgcaa gtgattcatc aagtgactca tcttttgaac 420

caataccatt gactataaaa gctatttttg aaagattcaa gaacaggaaa aagagatata 480

aaaaaaagaa aaagaggagg taccagccaa caggaagacc acggggaaga ccagaaggaa 540

ggagaaatcc tatatactca ctaatagata agaagaaaca atttagaagc agaggatctg 600

gcttcccatt tttagaatca gagaatgaaa aaaacgcacc ttggagaaaa attttaacgt 660

ttgagcaagc tgttgcaaga ggatttttta actatattga aaagctgaag tatgaacacc 720

acctgaaaga atcattgaag caaatgaatg ttggtgaaga tttagaaaat gaagattttg 780

acagtcgtag atacaaattt ttggatgatg atggatccat ttctcctatt gaggagtcaa 840

cagcagagga tgaggatgca acacatcttg aagataacga atgtgatatc aaattggcag 900

gggatagttt catagtaagt tctgaattcc ctgtaagact gagtgtatac ttagaagaag 960

aggatattac tgaagaagct gctttgtcta aaaagagagc tacaaaagcc aaaaatactg 1020

gacagagagg cctgaaaatg tgacaggatc atgaatgtca aaggctttta tcttgagaac 1080

atggtgtctg gagttaaagg tattggcata ctccacacat ctgtaccatt cttgagtgat 1140

cgcttaggaa tgaatgtgat ttgaactcat tcatgttgag agggtgtcaa attgagaacc 1200

aggtagatcc ccaccaccta cagtaaaaag gaccctaaag taaattggtt gaagaaatta 1260

gatcccaaag attcttggtg aattttgaag tcttcatcag tatatccata ttaaaacgag 1320

atgacagaag ccaaagtaat tatggcaagt aatggttttt atcttaacta taagttattt 1380

gctcaagggt gtaatggtca ttaccaaggc ttttagaatg cagtttctca tttgctgtgg 1440

acatgaccat aaaaaaaaat ttcccagtag gttttctatc tgctacgttg ctagcaatca 1500

gcttattggg aacagttgat taactgtaat agaaatgcaa tacaaataaa atgtgaacca 1560

catgtgattt ttctttaaaa tcagtgagat ttgaaaattc tcctagatct cttgaatcat 1620

gcaaatttgc tttgccttta tattgtaacc cttgtgggtt gctaataacc aagcagtttg 1680

tagtagagtt aactcaggct cgttctaggg actcattcat gttcactcac tgtacactca 1740

tctctggaaa tgtaaaattt acttttatac tattgttatg tagggctgac aggacaactg 1800

gatcagtttc attaaaaagg tatgtatgca ttagaaaaga catttgtatg ggtcatttca 1860

aagagggctt atgaggctgt gaaacccaga gctcttaacg ctgtgaccaa agatggaagt 1920

tctctatagg aagccatagc actcctaatg tttggtgcta tgttttcctg aggagatata 1980

aaacgtaata atccatgatt gttgccatgt gagagtttta aaggttaatc aaaatttctc 2040

ttcttcaggg caaacttgaa gataaatctt ttgactccag ctctttagag gatctaaagt 2100

gaccttgatg gacagtggaa gaaatcacaa catggaattc ctcgaataac aatttattga 2160

ctttaaataa ttttgtctaa tgctacatat acacaattaa aaaaccttta cactatttct 2220

agaaagtcag catgtatttt tggctcgaag tttctctagt gttttctgtg gaaggaataa 2280

aaatttgagt ttcaaaaaaa aaaaaaaaaa aaaaaaaaaa aaaaaaaaaa aaaaaa 2336

<210> 13
<211> 1361
<212> PRT

<213> Homo sapiens

<400> 13

Met Gly Ala Ala Gly Arg Gln Asp Phe Leu Phe Lys Ala Met Leu Thr
1 5 10 15

Ile Ser Trp Leu Thr Leu Thr Cys Phe Pro Gly Ala Thr Ser Thr Val
20 25 30

Ala Ala Gly Cys Pro Asp Gln Ser Pro Glu Leu Gln Pro Trp Asn Pro
35 40 45

Gly His Asp Gln Asp His His Val His Ile Gly Gln Gly Lys Thr Leu
50 55 60

Leu Leu Thr Ser Ser Ala Thr Val Tyr Ser Ile His Ile Ser Glu Gly
65 70 75 80

Gly Lys Leu Val Ile Lys Asp His Asp Glu Pro Ile Val Leu Arg Thr
85 90 95

Arg His Ile Leu Ile Asp Asn Gly Gly Glu Leu His Ala Gly Ser Ala
100 105 110

Leu Cys Pro Phe Gln Gly Asn Phe Thr Ile Ile Leu Tyr Gly Arg Ala
115 120 125

Asp Glu Gly Ile Gln Pro Asp Pro Tyr Tyr Gly Leu Lys Tyr Ile Gly
130 135 140

Val Gly Lys Gly Gly Ala Leu Glu Leu His Gly Gln Lys Lys Leu Ser
145 150 155 160

Trp Thr Phe Leu Asn Lys Thr Leu His Pro Gly Gly Met Ala Glu Gly
165 170 175

Gly Tyr Phe Phe Glu Arg Ser Trp Gly His Arg Gly Val Ile Val His
180 185 190

Val Ile Asp Pro Lys Ser Gly Thr Val Ile His Ser Asp Arg Phe Asp
195 200 205

Thr Tyr Arg Ser Lys Lys Glu Ser Glu Arg Leu Val Gln Tyr Leu Asn
210 215 220

Ala Val Pro Asp Gly Arg Ile Leu Ser Val Ala Val Asn Asp Glu Gly

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225                 230                 235                 240

Ser Arg Asn Leu Asp Asp Met Ala Arg Lys Ala Met Thr Lys Leu Gly
                245                 250                 255

Ser Lys His Phe Leu His Leu Gly Phe Arg His Pro Trp Ser Phe Leu
            260                 265                 270

Thr Val Lys Gly Asn Pro Ser Ser Ser Val Glu Asp His Ile Glu Tyr
        275                 280                 285

His Gly His Arg Gly Ser Ala Ala Ala Arg Val Phe Lys Leu Phe Gln
    290                 295                 300

Thr Glu His Gly Glu Tyr Phe Asn Val Ser Leu Ser Ser Glu Trp Val
305                 310                 315                 320

Gln Asp Val Glu Trp Thr Glu Trp Phe Asp His Asp Lys Val Ser Gln
                325                 330                 335

Thr Lys Gly Gly Glu Lys Ile Ser Asp Leu Trp Lys Ala His Pro Gly
            340                 345                 350

Lys Ile Cys Asn Arg Pro Ile Asp Ile Gln Ala Thr Thr Met Asp Gly
        355                 360                 365

Val Asn Leu Ser Thr Glu Val Val Tyr Lys Lys Gly Gln Asp Tyr Arg
    370                 375                 380

Phe Ala Cys Tyr Asp Arg Gly Arg Ala Cys Arg Ser Tyr Arg Val Arg
385                 390                 395                 400

Phe Leu Cys Gly Lys Pro Val Arg Pro Lys Leu Thr Val Thr Ile Asp
                405                 410                 415

Thr Asn Val Asn Ser Thr Ile Leu Asn Leu Glu Asp Asn Val Gln Ser
            420                 425                 430

Trp Lys Pro Gly Asp Thr Leu Val Ile Ala Ser Thr Asp Tyr Ser Met
        435                 440                 445

Tyr Gln Ala Glu Glu Phe Gln Val Leu Pro Cys Arg Ser Cys Ala Pro
    450                 455                 460

Asn Gln Val Lys Val Ala Gly Lys Pro Met Tyr Leu His Ile Gly Glu
465                 470                 475                 480

Glu Ile Asp Gly Val Asp Met Arg Ala Glu Val Gly Leu Leu Ser Arg
                485                 490                 495

Asn Ile Ile Val Met Gly Glu Met Glu Asp Lys Cys Tyr Pro Tyr Arg
            500                 505                 510

Asn His Ile Cys Asn Phe Phe Asp Phe Asp Thr Phe Gly Gly His Ile
        515                 520                 525

Lys Phe Ala Leu Gly Phe Lys Ala Ala His Leu Glu Gly Thr Glu Leu
    530                 535                 540

Lys His Met Gly Gln Gln Leu Val Gly Gln Tyr Pro Ile His Phe His
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545                 550                 555                 560

Leu Ala Gly Asp Val Asp Glu Arg Gly Gly Tyr Asp Pro Pro Thr Tyr
                565                 570                 575

Ile Arg Asp Leu Ser Ile His His Thr Phe Ser Arg Cys Val Thr Val
            580                 585                 590

His Gly Ser Asn Gly Leu Leu Ile Lys Asp Val Val Gly Tyr Asn Ser
        595                 600                 605

Leu Gly His Cys Phe Phe Thr Glu Asp Gly Pro Glu Glu Arg Asn Thr
    610                 615                 620

Phe Asp His Cys Leu Gly Leu Leu Val Lys Ser Gly Thr Leu Leu Pro
625                 630                 635                 640

Ser Asp Arg Asp Ser Lys Met Cys Lys Met Ile Thr Glu Asp Ser Tyr
                645                 650                 655

Pro Gly Tyr Ile Pro Lys Pro Arg Gln Asp Cys Asn Ala Val Ser Thr
            660                 665                 670

Phe Trp Met Ala Asn Pro Asn Asn Asn Leu Ile Asn Cys Ala Ala Ala
        675                 680                 685

Gly Ser Glu Glu Thr Gly Phe Trp Phe Ile Phe His His Val Pro Thr
    690                 695                 700

Gly Pro Ser Val Gly Met Tyr Ser Pro Gly Tyr Ser Glu His Ile Pro
705                 710                 715                 720

Leu Gly Lys Phe Tyr Asn Asn Arg Ala His Ser Asn Tyr Arg Ala Gly
                725                 730                 735

Met Ile Ile Asp Asn Gly Val Lys Thr Thr Glu Ala Ser Ala Lys Asp
            740                 745                 750

Lys Arg Pro Phe Leu Ser Ile Ile Ser Ala Arg Tyr Ser Pro His Gln
        755                 760                 765

Asp Ala Asp Pro Leu Lys Pro Arg Glu Pro Ala Ile Ile Arg His Phe
    770                 775                 780

Ile Ala Tyr Lys Asn Gln Asp His Gly Ala Trp Leu Arg Gly Gly Asp
785                 790                 795                 800

Val Trp Leu Asp Ser Cys Arg Phe Ala Asp Asn Gly Ile Gly Leu Thr
                805                 810                 815

Leu Ala Ser Gly Gly Thr Phe Pro Tyr Asp Asp Gly Ser Lys Gln Glu
            820                 825                 830

Ile Lys Asn Ser Leu Phe Val Gly Glu Ser Gly Asn Val Gly Thr Glu
        835                 840                 845

Met Met Asp Asn Arg Ile Trp Gly Pro Gly Gly Leu Asp His Ser Gly
    850                 855                 860

Arg Thr Leu Pro Ile Gly Gln Asn Phe Pro Ile Arg Gly Ile Gln Leu
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865                 870                 875                 880

Tyr Asp Gly Pro Ile Asn Ile Gln Asn Cys Thr Phe Arg Lys Phe Val
                885                 890                 895

Ala Leu Glu Gly Arg His Thr Ser Ala Leu Ala Phe Arg Leu Asn Asn
            900                 905                 910

Ala Trp Gln Ser Cys Pro His Asn Asn Val Thr Gly Ile Ala Phe Glu
        915                 920                 925

Asp Val Pro Ile Thr Ser Arg Val Phe Phe Gly Glu Pro Gly Pro Trp
    930                 935                 940

Phe Asn Gln Leu Asp Met Asp Gly Asp Lys Thr Ser Val Phe His Asp
945                 950                 955                 960

Val Asp Gly Ser Val Ser Glu Tyr Pro Gly Ser Tyr Leu Thr Lys Asn
                965                 970                 975

Asp Asn Trp Leu Val Arg His Pro Asp Cys Ile Asn Val Pro Asp Trp
            980                 985                 990

Arg Gly Ala Ile Cys Ser Gly Cys  Tyr Ala Gln Met Tyr  Ile Gln Ala
        995                 1000                1005

Tyr Lys  Thr Ser Asn Leu Arg  Met Lys Ile Ile Lys  Asn Asp Phe
    1010                1015                1020

Pro Ser  His Pro Leu Tyr Leu  Glu Gly Ala Leu Thr  Arg Ser Thr
    1025                1030                1035

His Tyr  Gln Gln Tyr Gln Pro  Val Val Thr Leu Gln  Lys Gly Tyr
    1040                1045                1050

Thr Ile  His Trp Asp Gln Thr  Ala Pro Ala Glu Leu  Ala Ile Trp
    1055                1060                1065

Leu Ile  Asn Phe Asn Lys Gly  Asp Trp Ile Arg Val  Gly Leu Cys
    1070                1075                1080

Tyr Pro  Arg Gly Thr Thr Phe  Ser Ile Leu Ser Asp  Val His Asn
    1085                1090                1095

Arg Leu  Leu Lys Gln Thr Ser  Lys Thr Gly Val Phe  Val Arg Thr
    1100                1105                1110

Leu Gln  Met Asp Lys Val Glu  Gln Ser Tyr Pro Gly  Arg Ser His
    1115                1120                1125

Tyr Tyr  Trp Asp Glu Asp Ser  Gly Leu Leu Phe Leu  Lys Leu Lys
    1130                1135                1140

Ala Gln  Asn Glu Arg Glu Lys  Phe Ala Phe Cys Ser  Met Lys Gly
    1145                1150                1155

Cys Glu  Arg Ile Lys Ile Lys  Ala Leu Ile Pro Lys  Asn Ala Gly
    1160                1165                1170

Val Ser  Asp Cys Thr Ala Thr  Ala Tyr Pro Lys Phe  Thr Glu Arg
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    1175                1180                1185

Ala Val  Val Asp Val Pro Met  Pro Lys Lys Leu Phe  Gly Ser Gln
    1190                1195                1200

Leu Lys  Thr Lys Asp His Phe  Leu Glu Val Lys Met  Glu Ser Ser
    1205                1210                1215

Lys Gln  His Phe Phe His Leu  Trp Asn Asp Phe Ala  Tyr Ile Glu
    1220                1225                1230

Val Asp  Gly Lys Lys Tyr Pro  Ser Ser Glu Asp Gly  Ile Gln Val
    1235                1240                1245

Val Val  Ile Asp Gly Asn Gln  Gly Arg Val Val Ser  His Thr Ser
    1250                1255                1260

Phe Arg  Asn Ser Ile Leu Gln  Gly Ile Pro Trp Gln  Leu Phe Asn
    1265                1270                1275

Tyr Val  Ala Thr Ile Pro Asp  Asn Ser Ile Val Leu  Met Ala Ser
    1280                1285                1290

Lys Gly  Arg Tyr Val Ser Arg  Gly Pro Trp Thr Arg  Val Leu Glu
    1295                1300                1305

Lys Leu  Gly Ala Asp Arg Gly  Leu Lys Leu Lys Glu  Gln Met Ala
    1310                1315                1320

Phe Val  Gly Phe Lys Gly Ser  Phe Arg Pro Ile Trp  Val Thr Leu
    1325                1330                1335

Asp Thr  Glu Asp His Lys Ala  Lys Ile Phe Gln Val  Val Pro Ile
    1340                1345                1350

Pro Val  Val Lys Lys Lys Lys  Leu
    1355                1360

<210>  14
<211>  755
<212>  PRT

<213>  Homo sapiens

<400>  14

Met Pro Pro Phe Leu Leu Leu Glu Ala Val Cys Val Phe Leu Phe Ser
1               5                  10                  15

Arg Val Pro Pro Ser Leu Pro Leu Gln Glu Val His Val Ser Lys Glu
            20                  25                  30

Thr Ile Gly Lys Ile Ser Ala Ala Ser Lys Met Met Trp Cys Ser Ala
        35                  40                  45

Ala Val Asp Ile Met Phe Leu Leu Asp Gly Ser Asn Ser Val Gly Lys
    50                  55                  60

Gly Ser Phe Glu Arg Ser Lys His Phe Ala Ile Thr Val Cys Asp Gly
65                  70                  75                  80
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Leu Asp Ile Ser Pro Glu Arg Val Arg Val Gly Ala Phe Gln Phe Ser
                85                  90                  95

Ser Thr Pro His Leu Glu Phe Pro Leu Asp Ser Phe Ser Thr Gln Gln
            100                 105                 110

Glu Val Lys Ala Arg Ile Lys Arg Met Val Phe Lys Gly Gly Arg Thr
        115                 120                 125

Glu Thr Glu Leu Ala Leu Lys Tyr Leu Leu His Arg Gly Leu Pro Gly
    130                 135                 140

Gly Arg Asn Ala Ser Val Pro Gln Ile Leu Ile Ile Val Thr Asp Gly
145                 150                 155                 160

Lys Ser Gln Gly Asp Val Ala Leu Pro Ser Lys Gln Leu Lys Glu Arg
                165                 170                 175

Gly Val Thr Val Phe Ala Val Gly Val Arg Phe Pro Arg Trp Glu Glu
            180                 185                 190

Leu His Ala Leu Ala Ser Glu Pro Arg Gly Gln His Val Leu Leu Ala
        195                 200                 205

Glu Gln Val Glu Asp Ala Thr Asn Gly Leu Phe Ser Thr Leu Ser Ser
    210                 215                 220

Ser Ala Ile Cys Ser Ser Ala Thr Pro Asp Cys Arg Val Glu Ala His
225                 230                 235                 240

Pro Cys Glu His Arg Thr Leu Glu Met Val Arg Glu Phe Ala Gly Asn
                245                 250                 255

Ala Pro Cys Trp Arg Gly Ser Arg Arg Thr Leu Ala Val Leu Ala Ala
            260                 265                 270

His Cys Pro Phe Tyr Ser Trp Lys Arg Val Phe Leu Thr His Pro Ala
        275                 280                 285

Thr Cys Tyr Arg Thr Thr Cys Pro Gly Pro Cys Asp Ser Gln Pro Cys
    290                 295                 300

Gln Asn Gly Gly Thr Cys Val Pro Glu Gly Leu Asp Gly Tyr Gln Cys
305                 310                 315                 320

Leu Cys Pro Leu Ala Phe Gly Gly Glu Ala Asn Cys Ala Leu Lys Leu
                325                 330                 335

Ser Leu Glu Cys Arg Val Asp Leu Leu Phe Leu Leu Asp Ser Ser Ala
            340                 345                 350

Gly Thr Thr Leu Asp Gly Phe Leu Arg Ala Lys Val Phe Val Lys Arg
        355                 360                 365

Phe Val Arg Ala Val Leu Ser Glu Asp Ser Arg Ala Arg Val Gly Val
    370                 375                 380

Ala Thr Tyr Ser Arg Glu Leu Leu Val Ala Val Pro Val Gly Glu Tyr
385                 390                 395                 400
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```
Gln Asp Val Pro Asp Leu Val Trp Ser Leu Asp Gly Ile Pro Phe Arg
                405                 410                 415

Gly Gly Pro Thr Leu Thr Gly Ser Ala Leu Arg Gln Ala Ala Glu Arg
            420                 425                 430

Gly Phe Gly Ser Ala Thr Arg Thr Gly Gln Asp Arg Pro Arg Arg Val
        435                 440                 445

Val Val Leu Leu Thr Glu Ser His Ser Glu Asp Glu Val Ala Gly Pro
    450                 455                 460

Ala Arg His Ala Arg Ala Arg Glu Leu Leu Leu Leu Gly Val Gly Ser
465                 470                 475                 480

Glu Ala Val Arg Ala Glu Leu Glu Glu Ile Thr Gly Ser Pro Lys His
                485                 490                 495

Val Met Val Tyr Ser Asp Pro Gln Asp Leu Phe Asn Gln Ile Pro Glu
            500                 505                 510

Leu Gln Gly Lys Leu Cys Ser Arg Gln Arg Pro Gly Cys Arg Thr Gln
        515                 520                 525

Ala Leu Asp Leu Val Phe Met Leu Asp Thr Ser Ala Ser Val Gly Pro
    530                 535                 540

Glu Asn Phe Ala Gln Met Gln Ser Phe Val Arg Ser Cys Ala Leu Gln
545                 550                 555                 560

Phe Glu Val Asn Pro Asp Val Thr Gln Val Gly Leu Val Val Tyr Gly
                565                 570                 575

Ser Gln Val Gln Thr Ala Phe Gly Leu Asp Thr Lys Pro Thr Arg Ala
            580                 585                 590

Ala Met Leu Arg Ala Ile Ser Gln Ala Pro Tyr Leu Gly Gly Val Gly
        595                 600                 605

Ser Ala Gly Thr Ala Leu Leu His Ile Tyr Asp Lys Val Met Thr Val
    610                 615                 620

Gln Arg Gly Ala Arg Pro Gly Val Pro Lys Ala Val Val Val Leu Thr
625                 630                 635                 640

Gly Gly Arg Gly Ala Glu Asp Ala Ala Val Pro Ala Gln Lys Leu Arg
                645                 650                 655

Asn Asn Gly Ile Ser Val Leu Val Val Gly Val Gly Pro Val Leu Ser
            660                 665                 670

Glu Gly Leu Arg Arg Leu Ala Gly Pro Arg Asp Ser Leu Ile His Val
        675                 680                 685

Ala Ala Tyr Ala Asp Leu Arg Tyr His Gln Asp Val Leu Ile Glu Trp
    690                 695                 700

Leu Cys Gly Glu Ala Lys Gln Pro Val Asn Leu Cys Lys Pro Ser Pro
705                 710                 715                 720
```

```
Cys Met Asn Glu Gly Ser Cys Val Leu Gln Asn Gly Ser Tyr Arg Cys
                725                 730                 735

Lys Cys Arg Asp Gly Trp Glu Gly Pro His Cys Glu Asn Arg Phe Leu
            740                 745                 750

Arg Arg Pro
        755
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<210> 15
<211> 300
<212> PRT

<213> Homo sapiens

<400> 15

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Met Arg Ile Ala Val Ile Cys Phe Cys Leu Leu Gly Ile Thr Cys Ala
1               5                   10                  15

Ile Pro Val Lys Gln Ala Asp Ser Gly Ser Ser Glu Glu Lys Gln Leu
            20                  25                  30

Tyr Asn Lys Tyr Pro Asp Ala Val Ala Thr Trp Leu Asn Pro Asp Pro
        35                  40                  45

Ser Gln Lys Gln Asn Leu Leu Ala Pro Gln Thr Leu Pro Ser Lys Ser
    50                  55                  60

Asn Glu Ser His Asp His Met Asp Asp Met Asp Asp Glu Asp Asp Asp
65                  70                  75                  80

Asp His Val Asp Ser Gln Asp Ser Ile Asp Ser Asn Asp Ser Asp Asp
                85                  90                  95

Val Asp Asp Thr Asp Asp Ser His Gln Ser Asp Glu Ser His His Ser
            100                 105                 110

Asp Glu Ser Asp Glu Leu Val Thr Asp Phe Pro Thr Asp Leu Pro Ala
        115                 120                 125

Thr Glu Val Phe Thr Pro Val Val Pro Thr Val Asp Thr Tyr Asp Gly
    130                 135                 140

Arg Gly Asp Ser Val Val Tyr Gly Leu Arg Ser Lys Ser Lys Lys Phe
145                 150                 155                 160

Arg Arg Pro Asp Ile Gln Tyr Pro Asp Ala Thr Asp Glu Asp Ile Thr
                165                 170                 175

Ser His Met Glu Ser Glu Glu Leu Asn Gly Ala Tyr Lys Ala Ile Pro
            180                 185                 190

Val Ala Gln Asp Leu Asn Ala Pro Ser Asp Trp Asp Ser Arg Gly Lys
        195                 200                 205

Asp Ser Tyr Glu Thr Ser Gln Leu Asp Asp Gln Ser Ala Glu Thr His
    210                 215                 220
```

Ser His Lys Gln Ser Arg Leu Tyr Lys Arg Lys Ala Asn Asp Glu Ser
225 230 235 240

Asn Glu His Ser Asp Val Ile Asp Ser Gln Glu Leu Ser Lys Val Ser
245 250 255

Arg Glu Phe His Ser His Glu Phe His Ser His Glu Asp Met Leu Val
260 265 270

Val Asp Pro Lys Ser Lys Glu Glu Asp Lys His Leu Lys Phe Arg Ile
275 280 285

Ser His Glu Leu Asp Ser Ala Ser Ser Glu Val Asn
290 295 300

<210> 16
<211> 829
<212> PRT

<213> Homo sapiens

<400> 16

Met Gly Leu Pro Arg Gly Pro Leu Ala Ser Leu Leu Leu Leu Gln Val
1 5 10 15

Cys Trp Leu Gln Cys Ala Ala Ser Glu Pro Cys Arg Ala Val Phe Arg
20 25 30

Glu Ala Glu Val Thr Leu Glu Ala Gly Gly Ala Glu Gln Glu Pro Gly
35 40 45

Gln Ala Leu Gly Lys Val Phe Met Gly Cys Pro Gly Gln Glu Pro Ala
50 55 60

Leu Phe Ser Thr Asp Asn Asp Asp Phe Thr Val Arg Asn Gly Glu Thr
65 70 75 80

Val Gln Glu Arg Arg Ser Leu Lys Glu Arg Asn Pro Leu Lys Ile Phe
85 90 95

Pro Ser Lys Arg Ile Leu Arg Arg His Lys Arg Asp Trp Val Val Ala
100 105 110

Pro Ile Ser Val Pro Glu Asn Gly Lys Gly Pro Phe Pro Gln Arg Leu
115 120 125

Asn Gln Leu Lys Ser Asn Lys Asp Arg Asp Thr Lys Ile Phe Tyr Ser
130 135 140

Ile Thr Gly Pro Gly Ala Asp Ser Pro Pro Glu Gly Val Phe Ala Val
145 150 155 160

Glu Lys Glu Thr Gly Trp Leu Leu Leu Asn Lys Pro Leu Asp Arg Glu
165 170 175

Glu Ile Ala Lys Tyr Glu Leu Phe Gly His Ala Val Ser Glu Asn Gly
180 185 190

Ala Ser Val Glu Asp Pro Met Asn Ile Ser Ile Ile Val Thr Asp Gln

```
        195                 200                 205

Asn Asp His Lys Pro Lys Phe Thr Gln Asp Thr Phe Arg Gly Ser Val
    210                 215                 220

Leu Glu Gly Val Leu Pro Gly Thr Ser Val Met Gln Val Thr Ala Thr
225                 230                 235                 240

Asp Glu Asp Asp Ala Ile Tyr Thr Tyr Asn Gly Val Val Ala Tyr Ser
                245                 250                 255

Ile His Ser Gln Glu Pro Lys Asp Pro His Asp Leu Met Phe Thr Ile
            260                 265                 270

His Arg Ser Thr Gly Thr Ile Ser Val Ile Ser Ser Gly Leu Asp Arg
        275                 280                 285

Glu Lys Val Pro Glu Tyr Thr Leu Thr Ile Gln Ala Thr Asp Met Asp
    290                 295                 300

Gly Asp Gly Ser Thr Thr Thr Ala Val Ala Val Val Glu Ile Leu Asp
305                 310                 315                 320

Ala Asn Asp Asn Ala Pro Met Phe Asp Pro Gln Lys Tyr Glu Ala His
                325                 330                 335

Val Pro Glu Asn Ala Val Gly His Glu Val Gln Arg Leu Thr Val Thr
            340                 345                 350

Asp Leu Asp Ala Pro Asn Ser Pro Ala Trp Arg Ala Thr Tyr Leu Ile
        355                 360                 365

Met Gly Gly Asp Asp Gly Asp His Phe Thr Ile Thr Thr His Pro Glu
    370                 375                 380

Ser Asn Gln Gly Ile Leu Thr Thr Arg Lys Gly Leu Asp Phe Glu Ala
385                 390                 395                 400

Lys Asn Gln His Thr Leu Tyr Val Glu Val Thr Asn Glu Ala Pro Phe
                405                 410                 415

Val Leu Lys Leu Pro Thr Ser Thr Ala Thr Ile Val Val His Val Glu
            420                 425                 430

Asp Val Asn Glu Ala Pro Val Phe Val Pro Pro Ser Lys Val Val Glu
        435                 440                 445

Val Gln Glu Gly Ile Pro Thr Gly Glu Pro Val Cys Val Tyr Thr Ala
    450                 455                 460

Glu Asp Pro Asp Lys Glu Asn Gln Lys Ile Ser Tyr Arg Ile Leu Arg
465                 470                 475                 480

Asp Pro Ala Gly Trp Leu Ala Met Asp Pro Asp Ser Gly Gln Val Thr
                485                 490                 495

Ala Val Gly Thr Leu Asp Arg Glu Asp Glu Gln Phe Val Arg Asn Asn
            500                 505                 510

Ile Tyr Glu Val Met Val Leu Ala Met Asp Asn Gly Ser Pro Pro Thr
```

```
        515                 520                 525

Thr Gly Thr Gly Thr Leu Leu Leu Thr Leu Ile Asp Val Asn Asp His
    530                 535                 540

Gly Pro Val Pro Glu Pro Arg Gln Ile Thr Ile Cys Asn Gln Ser Pro
545                 550                 555                 560

Val Arg Gln Val Leu Asn Ile Thr Asp Lys Asp Leu Ser Pro His Thr
                565                 570                 575

Ser Pro Phe Gln Ala Gln Leu Thr Asp Asp Ser Asp Ile Tyr Trp Thr
            580                 585                 590

Ala Glu Val Asn Glu Glu Gly Asp Thr Val Val Leu Ser Leu Lys Lys
        595                 600                 605

Phe Leu Lys Gln Asp Thr Tyr Asp Val His Leu Ser Leu Ser Asp His
    610                 615                 620

Gly Asn Lys Glu Gln Leu Thr Val Ile Arg Ala Thr Val Cys Asp Cys
625                 630                 635                 640

His Gly His Val Glu Thr Cys Pro Gly Pro Trp Lys Gly Gly Phe Ile
                645                 650                 655

Leu Pro Val Leu Gly Ala Val Leu Ala Leu Leu Phe Leu Leu Leu Val
            660                 665                 670

Leu Leu Leu Leu Val Arg Lys Lys Arg Lys Ile Lys Glu Pro Leu Leu
        675                 680                 685

Leu Pro Glu Asp Asp Thr Arg Asp Asn Val Phe Tyr Tyr Gly Glu Glu
    690                 695                 700

Gly Gly Gly Glu Glu Asp Gln Asp Tyr Asp Ile Thr Gln Leu His Arg
705                 710                 715                 720

Gly Leu Glu Ala Arg Pro Glu Val Val Leu Arg Asn Asp Val Ala Pro
                725                 730                 735

Thr Ile Ile Pro Thr Pro Met Tyr Arg Pro Arg Pro Ala Asn Pro Asp
            740                 745                 750

Glu Ile Gly Asn Phe Ile Ile Glu Asn Leu Lys Ala Ala Asn Thr Asp
        755                 760                 765

Pro Thr Ala Pro Pro Tyr Asp Thr Leu Leu Val Phe Asp Tyr Glu Gly
    770                 775                 780

Ser Gly Ser Asp Ala Ala Ser Leu Ser Ser Leu Thr Ser Ser Ala Ser
785                 790                 795                 800

Asp Gln Asp Gln Asp Tyr Asp Tyr Leu Asn Glu Trp Gly Ser Arg Phe
                805                 810                 815

Lys Lys Leu Ala Asp Met Tyr Gly Gly Gly Glu Asp Asp
            820                 825
```

<210> 17

<211> 694
<212> PRT

<213> Homo sapiens

<400> 17

```
Met Lys His Leu Lys Arg Trp Trp Ser Ala Gly Gly Gly Leu Leu His
1               5                  10                  15

Leu Thr Leu Leu Leu Ser Leu Ala Gly Leu Arg Val Asp Leu Asp Leu
            20                  25                  30

Tyr Leu Leu Leu Pro Pro Pro Thr Leu Leu Gln Asp Glu Leu Leu Phe
        35                  40                  45

Leu Gly Gly Pro Ala Ser Ser Ala Tyr Ala Leu Ser Pro Phe Ser Ala
    50                  55                  60

Ser Gly Gly Trp Gly Arg Ala Gly His Leu His Pro Lys Gly Arg Glu
65                  70                  75                  80

Leu Asp Pro Ala Ala Pro Pro Glu Gly Gln Leu Leu Arg Glu Val Arg
                85                  90                  95

Ala Leu Gly Val Pro Phe Val Pro Arg Thr Ser Val Asp Ala Trp Leu
            100                 105                 110

Val His Ser Val Ala Ala Gly Ser Ala Asp Glu Ala His Gly Leu Leu
        115                 120                 125

Gly Ala Ala Ala Ala Ser Ser Thr Gly Gly Ala Gly Ala Ser Val Asp
    130                 135                 140

Gly Gly Ser Gln Ala Val Gln Gly Gly Gly Gly Asp Pro Arg Ala Ala
145                 150                 155                 160

Arg Ser Gly Pro Leu Asp Ala Gly Glu Glu Glu Lys Ala Pro Ala Glu
                165                 170                 175

Pro Thr Ala Gln Val Pro Asp Ala Gly Gly Cys Ala Ser Glu Glu Asn
            180                 185                 190

Gly Val Leu Arg Glu Lys His Glu Ala Val Asp His Ser Ser Gln His
        195                 200                 205

Glu Glu Asn Glu Glu Arg Val Ser Ala Gln Lys Glu Asn Ser Leu Gln
    210                 215                 220

Gln Asn Asp Asp Asp Glu Asn Lys Ile Ala Glu Lys Pro Asp Trp Glu
225                 230                 235                 240

Ala Glu Lys Thr Thr Glu Ser Arg Asn Glu Arg His Leu Asn Gly Thr
                245                 250                 255

Asp Thr Ser Phe Ser Leu Glu Asp Leu Phe Gln Leu Leu Ser Ser Gln
            260                 265                 270

Pro Glu Asn Ser Leu Glu Gly Ile Ser Leu Gly Asp Ile Pro Leu Pro
        275                 280                 285
```

```
Gly Ser Ile Ser Asp Gly Met Asn Ser Ser Ala His Tyr His Val Asn
    290                 295                 300

Phe Ser Gln Ala Ile Ser Gln Asp Val Asn Leu His Glu Ala Ile Leu
305                 310                 315                 320

Leu Cys Pro Asn Asn Thr Phe Arg Arg Asp Pro Thr Ala Arg Thr Ser
                325                 330                 335

Gln Ser Gln Glu Pro Phe Leu Gln Leu Asn Ser His Thr Thr Asn Pro
            340                 345                 350

Glu Gln Thr Leu Pro Gly Thr Asn Leu Thr Gly Phe Leu Ser Pro Val
        355                 360                 365

Asp Asn His Met Arg Asn Leu Thr Ser Gln Asp Leu Leu Tyr Asp Leu
    370                 375                 380

Asp Ile Asn Ile Phe Asp Glu Ile Asn Leu Met Ser Leu Ala Thr Glu
385                 390                 395                 400

Asp Asn Phe Asp Pro Ile Asp Val Ser Gln Leu Phe Asp Glu Pro Asp
                405                 410                 415

Ser Asp Ser Gly Leu Ser Leu Asp Ser Ser His Asn Asn Thr Ser Val
            420                 425                 430

Ile Lys Ser Asn Ser Ser His Ser Val Cys Asp Glu Gly Ala Ile Gly
        435                 440                 445

Tyr Cys Thr Asp His Glu Ser Ser Ser His His Asp Leu Glu Gly Ala
    450                 455                 460

Val Gly Gly Tyr Tyr Pro Glu Pro Ser Lys Leu Cys His Leu Asp Gln
465                 470                 475                 480

Ser Asp Ser Asp Phe His Gly Asp Leu Thr Phe Gln His Val Phe His
                485                 490                 495

Asn His Thr Tyr His Leu Gln Pro Thr Ala Pro Glu Ser Thr Ser Glu
            500                 505                 510

Pro Phe Pro Trp Pro Gly Lys Ser Gln Lys Ile Arg Ser Arg Tyr Leu
        515                 520                 525

Glu Asp Thr Asp Arg Asn Leu Ser Arg Asp Glu Gln Arg Ala Lys Ala
    530                 535                 540

Leu His Ile Pro Phe Ser Val Asp Glu Ile Val Gly Met Pro Val Asp
545                 550                 555                 560

Ser Phe Asn Ser Met Leu Ser Arg Tyr Tyr Leu Thr Asp Leu Gln Val
                565                 570                 575

Ser Leu Ile Arg Asp Ile Arg Arg Arg Gly Lys Asn Lys Val Ala Ala
            580                 585                 590

Gln Asn Cys Arg Lys Arg Lys Leu Asp Ile Ile Leu Asn Leu Glu Asp
        595                 600                 605
```

```
Asp Val Cys Asn Leu Gln Ala Lys Lys Glu Thr Leu Lys Arg Glu Gln
    610                 615                 620

Ala Gln Cys Asn Lys Ala Ile Asn Ile Met Lys Gln Lys Leu His Asp
625                 630                 635                 640

Leu Tyr His Asp Ile Phe Ser Arg Leu Arg Asp Asp Gln Gly Arg Pro
                645                 650                 655

Val Asn Pro Asn His Tyr Ala Leu Gln Cys Thr His Asp Gly Ser Ile
            660                 665                 670

Leu Ile Val Pro Lys Glu Leu Val Ala Ser Gly His Lys Lys Glu Thr
        675                 680                 685

Gln Lys Gly Lys Arg Lys
    690
```

<210> 18
<211> 402
<212> PRT

<213> Homo sapiens

<400> 18

```
Met Lys Leu Glu Val Phe Val Pro Arg Ala Ala His Gly Asp Lys Gln
1               5                   10                  15

Gly Ser Asp Leu Glu Gly Ala Gly Gly Ser Asp Ala Pro Ser Pro Leu
            20                  25                  30

Ser Ala Ala Gly Asp Asp Ser Leu Gly Ser Asp Gly Asp Cys Ala Ala
        35                  40                  45

Lys Pro Ser Ala Gly Gly Gly Ala Arg Asp Thr Gln Gly Asp Gly Glu
    50                  55                  60

Gln Ser Ala Gly Gly Gly Pro Gly Ala Glu Glu Ala Ile Pro Ala Ala
65                  70                  75                  80

Ala Ala Ala Ala Val Val Ala Glu Gly Ala Glu Ala Gly Ala Ala Gly
                85                  90                  95

Pro Gly Ala Gly Gly Ala Gly Ser Gly Glu Gly Ala Arg Ser Lys Pro
            100                 105                 110

Tyr Thr Arg Arg Pro Lys Pro Pro Tyr Ser Tyr Ile Ala Leu Ile Ala
        115                 120                 125

Met Ala Ile Arg Asp Ser Ala Gly Gly Arg Leu Thr Leu Ala Glu Ile
    130                 135                 140

Asn Glu Tyr Leu Met Gly Lys Phe Pro Phe Phe Arg Gly Ser Tyr Thr
145                 150                 155                 160

Gly Trp Arg Asn Ser Val Arg His Asn Leu Ser Leu Asn Asp Cys Phe
                165                 170                 175
```

```
Val Lys Val Leu Arg Asp Pro Ser Arg Pro Trp Gly Lys Asp Asn Tyr
            180                 185                 190

Trp Met Leu Asn Pro Asn Ser Glu Tyr Thr Phe Ala Asp Gly Val Phe
        195                 200                 205

Arg Arg Arg Arg Lys Arg Leu Ser His Arg Ala Pro Val Pro Ala Pro
    210                 215                 220

Gly Leu Arg Pro Glu Glu Ala Pro Gly Leu Pro Ala Ala Pro Pro Pro
225                 230                 235                 240

Ala Pro Ala Ala Pro Ala Ser Pro Arg Met Arg Ser Pro Ala Arg Gln
                245                 250                 255

Glu Glu Arg Ala Ser Pro Ala Gly Lys Phe Ser Ser Ser Phe Ala Ile
            260                 265                 270

Asp Ser Ile Leu Arg Lys Pro Phe Arg Ser Arg Arg Leu Arg Asp Thr
        275                 280                 285

Ala Pro Gly Thr Thr Leu Gln Trp Gly Ala Ala Pro Cys Pro Pro Leu
    290                 295                 300

Pro Ala Phe Pro Ala Leu Leu Pro Ala Ala Pro Cys Arg Ala Leu Leu
305                 310                 315                 320

Pro Leu Cys Ala Tyr Gly Ala Gly Glu Pro Ala Arg Leu Gly Ala Arg
                325                 330                 335

Glu Ala Glu Val Pro Pro Thr Ala Pro Pro Leu Leu Leu Ala Pro Leu
            340                 345                 350

Pro Ala Ala Ala Pro Ala Lys Pro Leu Arg Gly Pro Ala Ala Gly Gly
        355                 360                 365

Ala His Leu Tyr Cys Pro Leu Arg Leu Pro Ala Ala Leu Gln Ala Ala
    370                 375                 380

Leu Val Arg Arg Pro Gly Pro His Leu Ser Tyr Pro Val Glu Thr Leu
385                 390                 395                 400

Leu Ala
```

<210> 19
<211> 209
<212> PRT
<213> Homo sapiens

<400> 19

```
Met Glu Lys His His Val Pro Ser Asp Phe Asn Val Asn Val Lys Val
1               5                   10                  15

Asp Thr Gly Pro Arg Glu Asp Leu Ile Lys Val Leu Glu Asp Met Arg
            20                  25                  30

Gln Glu Tyr Glu Leu Ile Ile Lys Lys Lys His Arg Asp Leu Asp Thr
        35                  40                  45
```

```
Trp Tyr Lys Glu Gln Ser Ala Ala Met Ser Gln Glu Ala Ala Ser Pro
    50                  55                  60

Ala Thr Val Gln Ser Arg Gln Gly Asp Ile His Glu Leu Lys Arg Thr
65                  70                  75                  80

Phe Gln Ala Leu Glu Ile Asp Leu Gln Ala Gln Tyr Ser Thr Lys Ser
                85                  90                  95

Ala Leu Glu Asn Met Leu Ser Glu Thr Gln Ser Arg Tyr Ser Cys Lys
            100                 105                 110

Leu Gln Asp Met Gln Glu Ile Ile Ser His Tyr Glu Glu Glu Leu Thr
        115                 120                 125

Gln Leu Arg His Glu Leu Glu Arg Gln Asn Asn Glu Tyr Gln Val Leu
    130                 135                 140

Leu Gly Ile Lys Thr His Leu Glu Lys Glu Ile Thr Thr Tyr Arg Arg
145                 150                 155                 160

Leu Leu Glu Gly Glu Ser Glu Gly Thr Arg Glu Glu Ser Lys Ser Ser
                165                 170                 175

Met Lys Val Ser Ala Thr Pro Lys Ile Lys Ala Ile Thr Gln Glu Thr
            180                 185                 190

Ile Asn Gly Arg Leu Val Leu Cys Gln Val Asn Glu Ile Gln Lys His
        195                 200                 205

Ala
```

<210> 20
<211> 278
<212> PRT
<213> Homo sapiens

<400> 20

```
Met Asp Lys Ser Gly Ile Asp Ser Leu Asp His Val Thr Ser Asp Ala
1               5                   10                  15

Val Glu Leu Ala Asn Arg Ser Asp Asn Ser Ser Asp Ser Ser Leu Phe
            20                  25                  30

Lys Thr Gln Cys Ile Pro Tyr Ser Pro Lys Gly Glu Lys Arg Asn Pro
        35                  40                  45

Ile Arg Lys Phe Val Arg Thr Pro Glu Ser Val His Ala Ser Asp Ser
    50                  55                  60

Ser Ser Asp Ser Ser Phe Glu Pro Ile Pro Leu Thr Ile Lys Ala Ile
65                  70                  75                  80

Phe Glu Arg Phe Lys Asn Arg Lys Lys Arg Tyr Lys Lys Lys Lys Lys
                85                  90                  95

Arg Arg Tyr Gln Pro Thr Gly Arg Pro Arg Gly Arg Pro Glu Gly Arg
            100                 105                 110
```

```
Arg Asn Pro Ile Tyr Ser Leu Ile Asp Lys Lys Lys Gln Phe Arg Ser
        115                 120                 125

Arg Gly Ser Gly Phe Pro Phe Leu Glu Ser Glu Asn Glu Lys Asn Ala
    130                 135                 140

Pro Trp Arg Lys Ile Leu Thr Phe Glu Gln Ala Val Ala Arg Gly Phe
145                 150                 155                 160

Phe Asn Tyr Ile Glu Lys Leu Lys Tyr Glu His His Leu Lys Glu Ser
                165                 170                 175

Leu Lys Gln Met Asn Val Gly Glu Asp Leu Glu Asn Glu Asp Phe Asp
            180                 185                 190

Ser Arg Arg Tyr Lys Phe Leu Asp Asp Asp Gly Ser Ile Ser Pro Ile
        195                 200                 205

Glu Glu Ser Thr Ala Glu Asp Glu Asp Ala Thr His Leu Glu Asp Asn
    210                 215                 220

Glu Cys Asp Ile Lys Leu Ala Gly Asp Ser Phe Ile Val Ser Ser Glu
225                 230                 235                 240

Phe Pro Val Arg Leu Ser Val Tyr Leu Glu Glu Glu Asp Ile Thr Glu
                245                 250                 255

Glu Ala Ala Leu Ser Lys Lys Arg Ala Thr Lys Ala Lys Asn Thr Gly
            260                 265                 270

Gln Arg Gly Leu Lys Met
        275
```

<210> 21
<211> 488
<212> PRT
<213> C-TERMINAL PORTION OF ColoUp2

<400> 21

```
Ala Val Leu Ala Ala His Cys Pro Phe Tyr Ser Trp Lys Arg Val Phe
1               5                   10                  15

Leu Thr His Pro Ala Thr Cys Tyr Arg Thr Thr Cys Pro Gly Pro Cys
            20                  25                  30

Asp Ser Gln Pro Cys Gln Asn Gly Gly Thr Cys Val Pro Glu Gly Leu
        35                  40                  45

Asp Gly Tyr Gln Cys Leu Cys Pro Leu Ala Phe Gly Gly Glu Ala Asn
    50                  55                  60

Cys Ala Leu Lys Leu Ser Leu Glu Cys Arg Val Asp Leu Leu Phe Leu
65                  70                  75                  80
```

```
Leu Asp Ser Ser Ala Gly Thr Thr Leu Asp Gly Phe Leu Arg Ala Asp
                85                  90                  95

Val Phe Val Lys Arg Phe Val Arg Ala Val Leu Ser Glu Asp Ser Arg
            100                 105                 110

Ala Arg Val Gly Val Ala Thr Tyr Ser Arg Glu Leu Leu Val Ala Val
        115                 120                 125

Pro Val Gly Glu Tyr Gln Asp Val Pro Asp Leu Val Trp Ser Leu Asp
    130                 135                 140

Gly Ile Pro Phe Arg Gly Gly Pro Thr Leu Thr Gly Ser Ala Leu Arg
145                 150                 155                 160

Gln Ala Ala Glu Arg Gly Phe Gly Ser Ala Thr Arg Thr Gly Gln Asp
                165                 170                 175

Arg Pro Arg Arg Val Val Val Leu Leu Thr Glu Ser His Ser Glu Asp
            180                 185                 190

Glu Val Ala Gly Pro Ala Arg His Ala Arg Ala Arg Glu Leu Leu Leu
        195                 200                 205

Leu Gly Val Gly Ser Glu Ala Val Arg Ala Glu Leu Glu Glu Ile Thr
    210                 215                 220

Gly Ser Pro Lys His Val Met Val Tyr Ser Asp Pro Gln Asp Leu Phe
225                 230                 235                 240

Asn Gln Ile Pro Glu Leu Gln Gly Lys Leu Cys Ser Arg Gln Arg Pro
                245                 250                 255

Gly Cys Arg Thr Gln Ala Leu Asp Leu Val Phe Met Leu Asp Thr Ser
            260                 265                 270

Ala Ser Val Gly Pro Glu Asn Phe Ala Gln Met Gln Ser Phe Val Arg
        275                 280                 285

Ser Cys Ala Leu Gln Phe Glu Val Asn Pro Asp Val Thr Gln Val Gly
    290                 295                 300

Leu Val Val Tyr Gly Ser Gln Val Gln Thr Ala Phe Gly Leu Asp Thr
305                 310                 315                 320
```

```
Lys Pro Thr Arg Ala Ala Met Leu Arg Ala Ile Ser Gln Ala Pro Tyr
                325                 330                 335

Leu Gly Gly Val Gly Ser Ala Gly Thr Ala Leu Leu His Ile Tyr Asp
            340                 345                 350

Lys Val Met Thr Val Gln Arg Gly Ala Arg Pro Gly Val Pro Lys Ala
        355                 360                 365

Val Val Val Leu Thr Gly Gly Arg Gly Ala Glu Asp Ala Ala Val Pro
    370                 375                 380

Ala Gln Lys Leu Arg Asn Asn Gly Ile Ser Val Leu Val Val Gly Val
385                 390                 395                 400

Gly Pro Val Leu Ser Glu Gly Leu Arg Arg Leu Ala Gly Pro Arg Asp
                405                 410                 415

Ser Leu Ile His Val Ala Ala Tyr Ala Asp Leu Arg Tyr His Gln Asp
            420                 425                 430

Val Leu Ile Glu Trp Leu Cys Gly Glu Ala Lys Gln Pro Val Asn Leu
        435                 440                 445

Cys Lys Pro Ser Pro Cys Met Asn Glu Gly Ser Cys Val Leu Gln Asn
    450                 455                 460

Gly Ser Tyr Arg Cys Lys Cys Arg Asp Gly Trp Glu Gly Pro His Cys
465                 470                 475                 480

Glu Asn Arg Phe Leu Arg Arg Pro
                485
```

<210> 22
<211> 403
<212> PRT
<213> HUMAN FOXQ1

<400> 22

```
Met Lys Leu Glu Val Phe Val Pro Arg Ala Ala His Gly Asp Lys Gln
1               5                   10                  15

Gly Ser Asp Leu Glu Gly Ala Gly Gly Ser Asp Ala Pro Ser Pro Leu
            20                  25                  30
```

```
Ser Ala Ala Gly Asp Asp Ser Leu Gly Ser Asp Gly Asp Cys Ala Ala
        35                  40                  45

Asn Ser Pro Ala Ala Gly Gly Gly Ala Arg Asp Pro Pro Gly Asp Gly
    50                  55                  60

Glu Gln Ser Ala Gly Gly Gly Pro Gly Ala Glu Glu Ala Ile Pro Ala
65                  70                  75                  80

Ala Ala Ala Ala Ala Val Val Ala Glu Gly Ala Glu Ala Gly Ala Ala
                85                  90                  95

Gly Pro Gly Ala Gly Gly Ala Gly Ser Gly Glu Gly Ala Arg Ser Lys
            100                 105                 110

Pro Tyr Thr Arg Arg Pro Lys Pro Pro Tyr Ser Tyr Ile Ala Leu Ile
        115                 120                 125

Ala Met Ala Ile Arg Asp Ser Ala Gly Gly Arg Leu Thr Leu Ala Glu
    130                 135                 140

Ile Asn Glu Tyr Leu Met Gly Lys Phe Pro Phe Phe Arg Gly Ser Tyr
145                 150                 155                 160

Thr Gly Trp Arg Asn Ser Val Arg His Asn Leu Ser Leu Asn Asp Cys
                165                 170                 175

Phe Val Lys Val Leu Arg Asp Pro Ser Arg Pro Trp Gly Lys Asp Asn
            180                 185                 190

Tyr Trp Met Leu Asn Pro Asn Ser Glu Tyr Thr Phe Ala Asp Gly Val
        195                 200                 205

Phe Arg Arg Arg Arg Lys Arg Leu Ser His Arg Ala Pro Val Pro Ala
    210                 215                 220

Pro Gly Leu Arg Pro Glu Glu Ala Pro Gly Leu Pro Ala Ala Pro Pro
225                 230                 235                 240

Pro Ala Pro Ala Ala Pro Ala Ser Pro Arg Met Arg Ser Pro Ala Arg
                245                 250                 255

Gln Glu Glu Arg Ala Ser Pro Ala Gly Lys Phe Ser Ser Ser Phe Ala
            260                 265                 270
```

```
Ile Asp Ser Ile Leu Arg Lys Pro Phe Arg Ser Arg Arg Leu Arg Asp
        275                 280                 285

Thr Ala Pro Gly Thr Thr Leu Gln Trp Gly Ala Ala Pro Cys Pro Pro
    290                 295                 300

Leu Pro Ala Phe Pro Ala Leu Leu Pro Ala Ala Pro Cys Arg Ala Leu
305                 310                 315                 320

Leu Pro Leu Cys Ala Tyr Gly Ala Gly Glu Pro Ala Arg Leu Gly Ala
                325                 330                 335

Arg Glu Ala Glu Val Pro Pro Thr Ala Pro Pro Leu Leu Leu Ala Pro
            340                 345                 350

Leu Pro Ala Ala Ala Pro Ala Lys Pro Leu Arg Gly Pro Ala Ala Gly
        355                 360                 365

Gly Ala His Leu Tyr Cys Pro Leu Arg Leu Pro Ala Ala Leu Gln Ala
    370                 375                 380

Ala Ser Val Arg Arg Pro Gly Pro His Leu Pro Tyr Pro Val Glu Thr
385                 390                 395                 400

Leu Leu Ala
```

<210> 23
<211> 400
<212> PRT
<213> MOUSE FOXQ1

<400> 23

```
Met Lys Leu Glu Val Phe Val Pro Arg Ala Ala His Gly Asp Lys Met
1               5                   10                  15

Gly Ser Asp Leu Glu Gly Ala Gly Ser Ser Asp Val Pro Ser Pro Leu
            20                  25                  30

Ser Ala Ala Gly Asp Asp Ser Leu Gly Ser Asp Gly Asp Cys Ala Ala
        35                  40                  45

Asn Ser Pro Ala Ala Gly Ser Gly Ala Gly Asp Leu Glu Gly Gly Gly
    50                  55                  60

Gly Glu Arg Asn Ser Ser Gly Gly Pro Ser Ala Gln Asp Gly Pro Glu
65                  70                  75                  80
```

```
Ala Thr Asp Asp Ser Arg Thr Gln Ala Ser Ala Ala Gly Pro Cys Ala
                85                  90                  95

Gly Gly Val Gly Gly Gly Glu Gly Ala Arg Ser Lys Pro Tyr Thr Arg
            100                 105                 110

Arg Pro Lys Pro Pro Tyr Ser Tyr Ile Ala Leu Ile Ala Met Ala Ile
        115                 120                 125

Arg Asp Ser Ala Gly Gly Arg Leu Thr Leu Ala Glu Ile Asn Glu Tyr
    130                 135                 140

Leu Met Gly Lys Phe Pro Phe Phe Arg Gly Ser Tyr Thr Gly Trp Arg
145                 150                 155                 160

Asn Ser Val Arg His Asn Leu Ser Leu Asn Asp Cys Phe Val Lys Val
                165                 170                 175

Leu Arg Asp Pro Ser Arg Pro Trp Gly Lys Asp Asn Tyr Trp Met Leu
            180                 185                 190

Asn Pro Asn Ser Glu Tyr Thr Phe Ala Asp Gly Val Phe Arg Arg Arg
        195                 200                 205

Arg Lys Arg Leu Ser His Arg Thr Thr Val Ser Ala Ser Gly Leu Arg
    210                 215                 220

Pro Glu Glu Ala Pro Pro Gly Pro Ala Gly Thr Pro Gln Pro Ala Pro
225                 230                 235                 240

Ala Ala Arg Ser Ser Pro Ile Ala Arg Ser Pro Ala Arg Gln Glu Glu
                245                 250                 255

Arg Ser Ser Pro Ala Ser Lys Phe Ser Ser Ser Phe Ala Ile Asp Ser
            260                 265                 270

Ile Leu Ser Lys Pro Phe Arg Ser Arg Arg Asp Gly Asp Ser Ala Leu
        275                 280                 285

Gly Val Gln Leu Pro Trp Gly Ala Ala Pro Cys Pro Pro Leu Arg Ala
    290                 295                 300

Tyr Pro Ala Leu Leu Pro Ala Ala Pro Gly Gly Ala Leu Leu Pro Leu
305                 310                 315                 320
```

```
Cys Ala Tyr Gly Ala Ser Glu Pro Thr Leu Leu Ala Ser Arg Gly Thr
                325                 330                 335

Glu Val Gln Pro Ala Ala Pro Leu Leu Leu Ala Pro Leu Ser Thr Ala
            340                 345                 350

Ala Pro Ala Lys Pro Phe Arg Gly Pro Glu Thr Ala Gly Ala Ala His
        355                 360                 365

Leu Tyr Cys Pro Leu Arg Leu Pro Thr Ala Leu Gln Ala Ala Ala Ala
    370                 375                 380

Cys Gly Pro Gly Pro His Leu Ser Tyr Pro Val Glu Thr Leu Leu Ala
385                 390                 395                 400
```

<210> 24
<211> 400
<212> PRT
<213> RAT FOX Q1

<400> 24

```
Met Lys Leu Glu Val Phe Ala Pro Arg Ala Ala His Gly Asp Lys Met
1               5                   10                  15

Gly Ser Asp Leu Glu Gly Ala Gly Ser Ser Asp Val Pro Ser Pro Leu
            20                  25                  30

Ser Ala Ala Gly Asp Asp Ser Leu Gly Ser Asp Gly Asp Cys Ala Ala
        35                  40                  45

Asn Ser Pro Ala Ala Gly Arg Gly Ala Val Asp Leu Glu Gly Gly Gly
    50                  55                  60

Gly Glu Arg Asn Ser Ser Gly Gly Ala Ser Thr Gln Asp Asp Pro Glu
65                  70                  75                  80

Val Thr Asp Gly Ser Arg Thr Gln Ala Ser Pro Val Gly Pro Cys Ala
                85                  90                  95

Gly Ser Val Gly Gly Gly Glu Gly Ala Arg Ser Lys Pro Tyr Thr Arg
            100                 105                 110

Arg Pro Lys Pro Pro Tyr Ser Tyr Ile Ala Leu Ile Ala Met Ala Ile
        115                 120                 125
```

```
Arg Asp Ser Ala Gly Gly Arg Leu Thr Leu Ala Glu Ile Asn Glu Tyr
    130                 135                 140

Leu Met Gly Lys Phe Pro Phe Phe Arg Gly Ser Tyr Thr Gly Trp Arg
145                 150                 155                 160

Asn Ser Val Arg His Asn Leu Ser Leu Asn Asp Cys Phe Val Lys Val
                165                 170                 175

Leu Arg Asp Pro Ser Arg Pro Trp Gly Lys Asp Asn Tyr Trp Met Leu
            180                 185                 190

Asn Pro Asn Ser Glu Tyr Thr Phe Ala Asp Gly Val Phe Arg Arg Arg
        195                 200                 205

Arg Lys Arg Leu Ser His Arg Thr Thr Val Ser Ala Ser Gly Leu Arg
    210                 215                 220

Pro Glu Glu Ala Pro Pro Gly Pro Ala Gly Thr Pro Gln Pro Ala Pro
225                 230                 235                 240

Thr Ala Gly Ser Ser Pro Ile Ala Arg Ser Pro Ala Arg Gln Glu Glu
                245                 250                 255

Gly Ser Ser Pro Ala Ser Lys Phe Ser Ser Ser Phe Ala Ile Asp Ser
            260                 265                 270

Ile Leu Ser Lys Pro Phe Arg Ser Arg Arg Asp Gly Asp Pro Ala Leu
        275                 280                 285

Gly Val Gln Leu Pro Trp Ser Ala Ala Pro Cys Pro Pro Leu Arg Ala
    290                 295                 300

Tyr Pro Ala Leu Leu Pro Ala Ser Ser Gly Gly Ala Leu Leu Pro Leu
305                 310                 315                 320

Cys Ala Tyr Gly Ala Gly Glu Pro Thr Leu Leu Ala Ser Arg Gly Ala
                325                 330                 335

Glu Val Gln Pro Ala Ala Pro Leu Leu Leu Ala Pro Leu Ser Thr Ala
            340                 345                 350

Ala Pro Ala Lys Pro Phe Arg Gly Pro Glu Thr Ala Gly Ala Ala His
        355                 360                 365
```

Leu Tyr Cys Pro Leu Arg Leu Pro Thr Ala Leu Gln Ala Ala Ala Ala
370 375 380

Cys Gly Pro Gly Pro His Leu Ser Tyr Arg Val Glu Thr Leu Leu Ala
385 390 395 400

<210> 25
<211> 1212
<212> DNA
<213> HUMAN FOXQ1

<400> 25
atgaagttgg aggtgttcgt ccctcgcgcg gcccacgggg acaagcaggg cagtgacctg 60

gagggcgcgg gcggcagcga cgcgccgtcc ccgctgtcgg cggcgggaga cgactccctg 120

ggctcagatg gggactgcgc ggccaacagc ccggccgcgg gcggcggcgc cagagatccg 180

ccgggcgacg gcgaacagag tgcgggaggc gggccgggcg cggaggaggc gatcccggca 240

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